REGIONAL MUNICIPALITY OF HALTON

WATER SYSTEM FIRE PROTECTION COST STUDY

November, 1983

R.M. LOUDON LTD.

A-1

REGIONAL MUNICIPALITY OF HALTON
WATER SYSTEM FIRE PROTECTION COST STUDY

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INTRODUCTION

REGIONAL MUNICIPALITY OF HALTON
WATER SYSTEM FIRE PROTECTION COST STUDY

INTRODUCTION

WATER SYSTEM FIRE PROTECTION COSTS HOW MUCH AND HOW CHARGED

Municipal water systems are designed to provide capacity for both day-to-day normal usage and for fire protection purposes.

Normal water consumption is usually charged based on volume sold. On the other hand, because water is not sold for fire fighting, municipalities have endeavoured to find ways of charging for fire protection costs based on potential demand. A charge based on actual usage would be impractical. Halton has followed a commonly-adopted practice of charging for fire protection on the mill rate.

This report uses industry-accepted methods to calculate the cost of providing capacity in the water system for fire protection, and then makes recommendations on how this cost should be charged.

The report is divided into six sections. Section 1 is an Executive Summary of the Report.

Section 2, "Water System Provides Capacity for Fire Protection," discusses the relationship between normal water consumption demands and fire protection requirements.

Section 3, entitled "Fire Protection Costs Can Be Segregated By Using Water System Design Criteria," reviews the methodology used to segregate fire protection costs, and develops percentage cost allocation factors which are used, with budgetary information, to calculate fire protection costs.

The fire protection costs are determined in Section 4 - "Cost of Extra Capacity for Fire Protection is Significant - A Phasing-In Program is Proposed."

Chapter 5 reviews and makes recommendations on methods of charging fire protection costs.

The report concludes in Section 6 with an analysis on the impact which the recommendations would have on customers.

SECTION 1

EXECUTIVE SUMMARY

SECTION 1
EXECUTIVE SUMMARY

DETAILED REPORT PAGE REFERENCE

This report has been prepared to establish a solid technical and defensible basis for calculating the fire protection cost. It reviews and makes recommendations on the amount charged and method of charging water system fire protection costs in Halton based on engineered system design criteria.

BACKGROUND:

Halton annually levies a "hydrant rental" charge to each area municipality for the cost of providing water system capacity for fire fighting. This continues the practice, followed locally prior to Halton's formation and common in other Ontario municipalities, of including these costs as part of property taxes.

The cost of providing capacity in the water system for fire protection can be significant. A certain basic capacity is needed for all systems. Pumps, mains and storage all must have a certain minimum size. 16 - 19

Fire protection costs can be determined by analyzing expenditure, engineering and system usage data. The proposed method was originally developed by the American Water Works Association, (A.W.W.A.)and has achieved widespread support. It has been used in such municipalities as the Region of Durham and Peterborough in Ontario, Saint John, N.B., and Charlottetown, P.E.I. Two surveys of Ontario municipalities, including similar Regions, indicates that many do not calculate their charge on a technical basis. It has just "evolved". Those that could document their calculation method had fire protection charges which are 9 to 14% of total water revenues. Halton's presently is 4.6%. The proposed charge is 10%. 10 - 11

Much of this report is technical in nature, outlining in detail the calculation of the fire protection charge. The calculation is based on 1983 budget data with a method provided for setting future charges Detailed expenditure data was obtained from the Maintenance Management System budget. The cost allocations are based on actual system usage data, engineering reports and on IAO guidelines. (1)

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(1) The Insurer's Advisory Organization is the accepted authority for municipal fire protection requirements.

DETAILED REPORT PAGE REFERENCE

In most cases, Halton could provide the required information in sufficient detail for the calculation method. However, in some cases, it was not feasible to obtain specific information. For example, the local fire departments could not estimate the volume of water used for fire fighting. In such cases, we drew on experience in other municipalities. Where estimates were made, they were conservative, understating fire protection costs.

PROPOSED METHOD:

The current Fire Protection Charge has been developed, based on the application of .08 mills on the weighted, equalized urban assessment. During the period 1978 to 1981, the proportion of total revenue which this methodology generated declined from 6.2% to 4.6% due to a more rapid increase in system costs than in assessment base. 12

Consequently, a change in the formula was introduced in 1982, which effectively indexes the Fire Protection Charge, thereby preventing its further erosion as a % of total revenues. The existing Fire Protection Charge is $537,544 (4.7% of total revenues).

The proposed methodology would result in 1983 charge of $1,150,339, 114% than the current charge level. This is about 10% of total revenue, and brings the charge line with other municipalities who have a calculated charge. It is proposed that the increase be adopted in principle, with a phase-in over the period 1984-1986 20 22

PHASE-IN FACTORS (% OF PROPOSED CHARGE)

1983	1984	1985	1986
Existing Charge	64.5%	82.2%	100.0%

The proposed charges would be indexed each year to allow for expenditure increases. The charge should be periodically updated using the more detailed analysis method set out herein. App. 1

*The proposed methodology would result in 1983 charges of $1,150,339, 114% than the current charge level.

DETAILED
REPORT PAGE
REFERENCE

During the three-year phase-in period, the charge would be calculated as follows:

$$\text{Fire Protection Charge in Year X} = \$1{,}150{,}339 \times (\text{Phase-In Factor Year X}) \times \frac{\text{Net Expenditure Year X}}{\$10{,}910{,}395}$$

Where - $1,150,339 is the recommended fire protection charge based on 1983 data.

The phase-in factors are set out on the previous page.

- The net expenditures would be calculated as in Exhibit 7; net of Local Improvement Act revenues, various specific cost recoveries, and the Rate Stabilization Grant.
- $10,910,395 is the 1983 net water expenditure.

It is recommended that the charge continue to be levied against the area municipalities and included in the property tax. The use of the property tax is widely adopted in Ontario, and is the same method used for other services supplied on a "readiness to serve basis", including police and the fire department itself. It is not appropriate to charge fire protection costs on a "user pay" basis - the principle used in setting water rates. Since the cost of fire protection is a local responsibility, all costs associated with this service should rightly be included in the local mill rate. 23 - 26

It is also recommended that the levy against each area municipality continue to be based on equalized urban service area assessment, as calculated in Exhibit 10. 26

The only change from the existing allocation method is the use of three-year average equalization factors, rather than the single-year factor now used. This change was suggested by an area municipality and brings the calculation in line with the allocation of the Regional levy. 28

DETAILED REPORT PAGE REFERENCE

IMPACT:

The increase in the fire protection charge from $537,544 to $1,150,339 would mean that $612,795 less revenue need be generated from the water rates.

At full phase-in, local residential general mill rates would increase: App. 3

1983 RESIDENTIAL GENERAL MILL RATE INCREASE DUE TO REVISED FIRE PROTECTION CHARGE

Burlington	1.38%
Halton Hills:	
Acton	1.69%
Georgetown	1.78%
Milton	1.94%
Oakville	1.64%

The impact of the increased local property tax and decreased water rates on a variety of customers has been analyzed. Some typical examples of the total impact of the three-year phase-in are as follows: Ex. 11, 28

SOME RANDOM EXAMPLES OF FULLY PHASED-IN IMPACT ON COMBINED WATER, SEWER & LOCAL TAX BILLS

	EXISTING CHARGE	PROPOSED CHARGE	DIFFERENCE $	DIFFERENCE %
RESIDENTIAL				
Burlington	665	664	(1)	(0.2%)
Halton Hills				
Acton	585	587	2	0.3%
Georgetown	547	555	8	1.5%
Milton	477	476	(1)	(0.2%)
Oakville	988	992	4	0.4%
COMMERCIAL/INDUSTRIAL				
Burlington	2,112	2,117	5	0.2%
Halton Hills				
Acton	1,456	1,422	(34)	(2.4%)
Georgetown	10,924	11,217	293	2.7%
Milton	4,863	4,846	(17)	(0.4%)
Oakville	13,938	13,617	(321)	(2.3%)

The impact of the shift in costs from the water rate to the property tax is minimal for most customers. The recommended increase in the fire protection charge does not appear to shift costs to any one class of customer. Few residential customers will experience a total change of more than 1 1/2% over the three-year period due to this change.

It should be noted that the additional cost of providing water system capacity for fire protection is more than offset by savings in fire insurance premiums which are estimated at $75 per annum for a typical Halton single family residence.

SUMMARY

In summary, the use of the mill rate for levying a fire protection water charge continues the local practice followed throughout Halton prior to the Region's formation and is supported by the following points:

- The generally accpeted method of charging for municipal costs on a "readiness to serve" basis is the property tax - the same method as fire department costs which are a local responsibility. This method of charging is more appropriate than a "user-pay" approach for a service which potentially benefits all, but is actually used by few.
- Incorporation of the revised fire protection charge in the local mill rate enhances the equitability of the charge by insuring that those ratepayers with high assessments and low consumption (i.e.: plazas, dry industries, warehouse facilities) will contribute to fire protection costs at a level more reflective of the benefits derived through considerably reduced insurance premiums.
- The basis of the revised fire protection charge is endorsed by the leading water industry organization, the American Waterworks Association (A.W.W.A.).

DETAILED
REPORT PAGE

REFERENCE

- The recommended inclusion of the fire protection charge in the mill rate is common, and widely accepted as a practical and appropriate method of charging water system fire protection costs throughout Ontario.
- The proposed application of this fee on the local mill rate is supported by provincial legislation.
- The basis of the revised fire protection charge is premised on engineered water system design criteria.

SECTION 2

WATER SYSTEM PROVIDES CAPACITY FOR FIRE PROTECTION

DETAILED REPORT

SECTION 2

WATER SYSTEM PROVIDES CAPACITY FOR FIRE PROTECTION

Although water systems are now generally taken for granted, they were originally developed to meet very pressing public health and fire protection needs. In fact, although many may think of fire protection as secondary, it has equal consideration and originally may have been the reason for initiating a municipal water works:

> "A hundred years ago, fire protection led the list of benefits of a public water system. In fact, many old systems were started for the sole purpose of improving fire protection."(1)

The Halton water systems have been designed based on analyses of both consumption demands and accepted fire protection standards:

Normal Consumption Demands

The normal consumption demands are based on actual water consumption experience in each municipality. Over the years, engineering reports have been prepared which analyze historical water consumption demands and establish capacity requirements for various water system components.

Fire Protection Demands

Fire protection demands are based on Insurers Advisory Organization recommendations (IAO). The IAO is an insurance industry organization which publishes guidelines(2) for municipal fire protection. Municipal water system designers across Canada look to the IAO for guidance in the provision of water system capacity for fire protection.

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(1) AWWA Mainstream, April, 1981

(2) Water Supply for Public Fire Protection - A Guide to Recommended Practice, Fire Underwriters Survey, 1981

> Although their recommendations are not legislative requirements, because of the IAO's broad experience in this field, they are normally followed in the design of municipal water systems in Canada.

In the next section, we develop water consumption demand information, review IAO guidelines and calculate cost allocation factors. The "shared cost principle" is also set out. This is the principle of considering both normal consumption and fire protection as equally important, and segregating their costs on the basis of their relative capacity requirements.

SECTION 3

FIRE PROTECTION COSTS CAN BE SEGREGATED BY USING WATER SYSTEM DESIGN CRITERIA

EXHIBIT 1

FIRE PROTECTION CHARGES BY OTHER REGIONAL[1] MUNICIPALITIES
RESULTS OF SURVEY

	DURHAM	HALDIMAND NORFOLK	OTTAWA CARLETON	PEEL	SUDBURY	HAMILTON WENTWORTH	HALTON BUDGET[4]	HALTON PROPOSED
REVENUE BY SOURCE								
FIRE PROTECTION								
- Mill Rate	0	128,350	5,668,325	0	4,835,140[2]	1,086,000	540,100	1,150,339
- Sprinkler/Fire Line/Hydrants	276,000	0	0	0	8,360	-	0	0
- Water Rate	1,072,000	N/A (3)	0	N/A	156,500	-	-	0
Total Fire Protection	1,348,000	N/A (3)	5,668,325	N/A	5,000,000(2)	1,086,000	540,100	1,150,339
WATER RATES (Excl. Fire Protection)	6,446,000	2,099,266(3)	21,100,000	18,700,000	5,000,000	(17,205,000	8,961,600	8,351,361
OTHER	2,150,000	313,738	2,196,637	0	435,000	(	1,966,500	1,966,500
Total Revenue	9,944,000	2,541,354	28,964,962	18,700,000	10,435,000	18,291,000	11,468,200	11,468,200
FIRE PROTECTION REVENUE AS A % OF TOTAL REVENUE								
- Mill Rate	0	5.1	20		46[2]	6	4.7	10.0
- Sprinkler, etc.	2.8	0	0		-	0	0	0
- Water Rate	10.8	N/A	0		2	0	0	0
Total	13.6	N/A	20	N/A	48[2]	6	4.7	10.0
SPECIAL FIRE PROTECTION CHARGE METHODS								
Private Hydrant	No	Yes	No	No	No		No	No
Fire Line Service	Yes	No	No	No	No		No	No
Sprinkler Head	No	No	No	No	Yes		No	No
Mill Rate	No	Yes	Yes	No	(2)	Yes	Yes	Yes
YEAR DATA SUPPLIED FOR	1982	1982 (Sources of Rev. 1981)	1982	1982	1982		1983	1983

(1) Only the single-tier regions are included, that is those where the Region has responsibility for the total water systems.
(2) Sudbury mill rate revenue is not specifically for fire protection.
(3) Haldimand-Norfolk recognizes that a portion of fire protection costs are included in their mill rate, but they have not yet been identified.
(4) The final hydrant rental fee was $537,544.

SECTION 3

FIRE PROTECTION COSTS CAN BE SEGREGATED BY USING WATER SYSTEM DESIGN CRITERIA

THE CALCULATION OF WATER SYSTEM FIRE PROTECTION COSTS HAS BEEN COMMON FOR MANY YEARS IN NORTH AMERICA

There has been active interest for many years in the calculation of water rates and fire protection charges. In the early 1900s, extensive debates were carried out under the auspices of the American Water Works Association (AWWA) on fire protection costs. Over the years, there have been many articles published in the AWWA Journal on this subject. The AWWA also produces rate-setting manuals. The methods used in this report are based on the AWWA's most recent water-rate-setting manual, and on the AWWA - Ontario Section's own 1979 water rate manual.(1)

MOST ONTARIO MUNICIPALITIES SEGREGATE FIRE PROTECTION COSTS

We have carried out two surveys of Ontario municipalities to obtain information on their approaches to charging for water system fire protection costs.

The first survey, carried out for this report, included all seven single-tier Regional municipalities. Detailed results are provided in Exhibit 1. All but Peel had fire protection charges, and all but one of these used the mill rate. Excluding Halton and Sudbury, the per cent of revenue for fire protection varied between 6% and 20%. Sudbury is excluded because they also charge other water costs in their 46% mill rate levy. Durham's fire protection charge calculation method is similar to the one proposed for Halton. No information was made available on the methods used in the other Regions. Haldimand-Norfolk plans a review of their calculation.

(1) Water Rates in Ontario - Principles and Practices, Ontario Municipal Water Association, Ontario Section - American Water Works Association, May, 1979

The second survey was carried out for the City of Peterborough/ Peterborough Utilities Commission[1] and was of 12 non-Regional municipalities with populations ranging from 10,000 to 225,000. Both surveys are summarized in Exhibit 2, below. All except one municipality, Kingston, had a charge which they considered to be for fire protection. The per cent of revenue for fire protection ranged from 3% to 12%. Those with the highest percentages (9.5 to 12.0%) based their charges on detailed calculations. The others did not provide the basis of their charge. Peterborough, at 12%, used the same method as proposed for Halton. All those with fire protection charges (91%) considered the mill rate as an appropriate method for charging, with well over half using this method exclusively.

EXHIBIT 2

FIRE PROTECTION CHARGES SURVEY - SUMMARY RESULTS

	TYPE OF MUNICIPALITY		HALTON	
	NON-REGIONAL	REGIONAL	EXISTING	PROPOSED
% of Revenue for Fire Protection	3% to 12%	6% to 20%	4.6%	10.0%
% of Municipalities Charging for Fire Protection	91%	86%	-	
Number Surveyed	12	7 (all)	-	
Methods Used to Charge Fire Protection Costs				
- Mill Rate	91%	71%	Yes	Yes
- Sprinkler, etc.	36%	43%	No	No

The studies confirm that the practice of charging for water system fire protection costs is common, and that the mill rate is almost always the chosen method. Halton's charge (described in more detail below), at 4.6%, is amongst the smallest of those surveyed.

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(1) Reported in City of Peterborough/Peterborough Utilities Commission Report on Water System Fire Protection Costs, November 30, 1982, Pg. F38, Coopers & Lybrand, in association with R.M. Loudon Ltd.

HALTON'S FIRE PROTECTION CHARGE IS ABOUT 5% OF WATER REVENUE - ITS CALCULATION BASIS IS UNKNOWN

Many municipalities have water rates and fire protection charges which have evolved over the years, with the original basis of their calculation no longer known. This appears to be the case with Halton's fire protection charge. Although the method of allocating the charge between municipalities is well documented, the earliest reference which we have found in the calculation of its dollar value provides very little technical support:

> "The fee to be paid by area municipalities with respect to fire hydrants is based upon the application of a mill rate of .08 mills on the equalized assessment, as published in the Ontario Gazette, Vol. 112 - 28, weighted to reduce the residential and farm assessment by 15% and further revised to exclude all assessment outside of the urban service areas." (By-law 80-70, passed July 16, 1980)

This establishes a fire protection charge which is tied to assessment, but does not relate the charge to actual expenditures.

Halton's fire protection charges over the last six years are as follows:

EXHIBIT 3

HALTON FIRE PROTECTION CHARGE REVENUE 1978 - 1983

	ACTUAL					BUDGET
	1978	1979	1980	1981	1982	1983
Fire Protection Revenue	343,500	355,400	387,949	415,397	462,046	537,544
Total Revenue	5,573,112	6,351,676	6,977,455	8,962,000*	9,969,000	11,468,200
% for Fire Protection	6.2%	5.6%	5.6%	4.6%	4.6%	4.7%

* Includes applied surplus

There has been a steady increase in the fire protection charge. However, the proportion of total revenue has dropped over the six-year period from 6.2% to 4.7%. The reason for this decrease is that the fire protection charge was tied to a mill rate of 0.08 mills in 1980 and 1981 (and presumably earlier). Since the assessment base grew more slowly than costs, the mill rate contribution share had an equivalent decrease. By 1981, the fire protection charge, in relative terms, had decreased 25%. Starting in 1982, the fire protection charge has been indexed based on expenditures. This has stopped the further erosion of the fire protection charges, maintaining them at about 4.6% of total revenue. The method used to calculate the existing 1983 hydrant rental charge is provided as Appendix 2.

THE SHARED-COST PRINCIPLE IS ADOPTED FOR ALLOCATING COSTS TO FIRE PROTECTION

Water systems are designed for general consumption and for fire protection demands. Three different approaches are possible for weighting the relative importance of the two requirements:

"(1) General service as an increment cost - The cost of a system to provide fire protection alone is compared to the cost of works to provide both general service and fire protection and the functions other than the public fire protection are assigned only to incremental costs. This method, which assumes that the works were installed mainly for fire protection, is clearly unrealistic and inappropriate.

(2) Fire protection as an incremental cost - This method is the converse of method number (1) and assumes that public fire protection should be charged with only the incremental cost above the cost of a plant designed to provide the functions other than public fire protection. This method was rejected because of the inequity which it produces.

(3) Shared-cost principle - This method is based on the theory that neither general use nor fire protection is more important than the other, and it, therefore,

provides for the allocation of all costs of a joint nature on the basis of various relations between the capacity required for public fire protection and the capacity required for other uses. The joint committee believes this method provides a fair and practical procedure for allocating the joint cost."(1)

Since this was published (1951), this method has been supported in most, if not all, cases, including the AWWA rate manuals.

We support the view that neither general consumption nor fire protection can be considered as of secondary importance.

The shared-cost principle is adopted in this report and takes the form:

$$\text{Proportion of costs for fire protection} = \frac{\text{Fire Protection}}{\text{Fire Protection + General Service}}$$

$$\text{Proportion of costs for general service} = \frac{\text{General Service}}{\text{Fire Protection + General Service}}$$

THE SHARED-COST PRINCIPLE IS APPLIED USING THREE DIFFERENT PARAMETERS - CAPACITY, USAGE AND DIRECTLY

Costs are shared between general consumption and fire protection, using three different parameters:

. Directly - Parts of the water system are entirely related to one or the other of fire protection or general consumption. These costs can be assigned directly to the appropriate function.

(1) Fundamental Considerations in Rates and Rate Structures for Water and Sewage Works, Ohio State Law Journal Joint Committee ASCE and Municipal Law Section, American Bar Association, 1951, Pg. 231

- By Usage - Other costs are related to the volume of water actually used. Costs such as power and chemicals vary directly with volume. If no water is used, there would be little or no cost. Operating costs fall into this category.

- By Capacity - For most of the time, a water system operates at well below capacity. However, the capacity is available "on standby" to provide for such peak demands as lawn watering and fire fighting. Most of the system's capital and maintenance costs are capacity-related. These costs are allocated based on the relative capacity provided in each system component for general consumption versus fire protection.

Allocation factors are developed for the various water systems' cost centres or "functional categories," using the foregoing parameters, in the following subsection.

ALLOCATION FACTORS ARE DEVELOPED FOR WATER SYSTEM FUNCTIONAL CATEGORIES

The cost analysis requires expenditures to be grouped in various functional cost categories:

Water Supply Plants

Water supply facilities are not designed to directly provide for fire protection demands. The supply source is designed for normal maximum-day consumption, with fire protection taken out of storage. Water used from storage for fire protection is normally replenished at off-peak times when capacity is available. Actually, since the water used for fire fighting does not need treatment, only the pumping facilities at the water plant are needed for fire protection. Therefore, the only filter plant costs applicable to fire protection are for the volume actually used. We have surveyed the fire chiefs to determine an estimate of the quantity. Unfortunately, this volume is not metered. We estimate that less than 1% of total pumpage is used for fire protection, and have used a conservative value of 0.5%.

Reservoirs

An accepted formula for designing water storage facilities is as follows:

Required Storage = Fire Storage + Equalization Storage + Emergency Storage

Where - Fire Storage is based on IAO guidelines[1] on fire demand rates and duration and on the Fire Underwriters' Survey for Halton (see letter from the IAO in the Appendix)

- Equalization Storage provides operating flexibility by allowing the supply plant

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(1) op cit

to provide water at average rates with peak rates provided from storage. It has been calculated as 20% of maximum day.

- Emergency Storage is provided by increasing fire and equalization by 25%

The reservoir storage capacity calculation is made in Appendix 6

Average Halton fire storage capacity is 22.9%.

Mai s

Water mains transmit water from the source of supply to pumping stations, res rvoirs and to the consumer. The largest mains are classified as transmis ion mains. They are designed to carry flows at maximum-day rates from the supply source, and to interconnect with the distribution mains. Their siz ng is most influenced by normal cons nption demands.

The bulk of the system, however, is made up of distribution mains. The influence of fire requirements on the sizing of these mains is much gre ter than on transmission mains. For example, the minimum size of water mai s normally used in residential areas is 6-inch. This size is largely bas d on fire requirements.

The mains cost allocations are as follows:

Transmission Mains

Transmission mains have similar design characteristics to the water plant. They would be designed to transmit maximum-day flows. The capacity for fire protection would be limited to the annual percentage used for fire protection, or approximately 1%.

Distribution Mains

Distribution mains are designed for peak demand requirements. These can be either caused by maximum-hour consumption or by fire requirements. The percentage for fire protection is calculated in Exhibit 6, and is 23.3.

There is a considerable spread between the 1% transmission allocation and the 22.9% for the distribution systems. Actually there are few mains which act solely as transmission mains. The higher cost allocation factor applies to most of the water mains. Sometimes the higher distribution allocation factor is applied against all mains. We have designated 25% of mains capital costs as transmission-related. This provides a very conservative approach to allocating these costs.

Pumping Stations

The pumping facilities at the source of supply have been included in the supply cost, and thus are considered to have minimal fire protection component. The remaining pumping stations away from the supply points have been categorized as booster pumping stations. Their capacity requirements are more closely associated with distribution mains, and the Halton cost allocation factor is 19.7%. This calculation is carried out in Exhibit 6.

Hydrants

Hydrants are 100% for fire protection.

Customer Costs

Customer costs include services, meter maintenance, meter reading, billing and collecting. The only portion of this cost which would have a fire protection component is for unmetered fire line services. Approximately 1% of services could be classified as unmetered fire lines. They

EXHIBIT 5

SUMMARY OF FIRE PROTECTION COST ALLOCATIONS

FUNCTIONAL COST CATEGORY	DESIGN CRITERIA	COST ALLOCATION
Water Supply		
Operating) Maintenance) Capital)	Maximum Day	Treatment not required for fire protection - Allocate only 0.5% for volume of water used
Reservoirs		
Operating	Maximum Day & Fire	No operating cost
Maintenance) Capital)		22.9% for capacity provided for fire protection
Pumping Stations		
Operating	Maximum Hour & Fire	0.5% for volume pumped
Maintenance) Capital)		19.7% for capacity provided for fire protection
Transmission Mains	Maximum Day	Treated the same as Water Supply
Distribution Mains		
Operating	Maximum Hour & Fire	No operating cost
Maintenance) Capital)		23.3% for capacity provided for fire protection
Hydrants	Fire	100% for fire protection
Customer Costs		
- Services - Meter Reading & Maintenance - Customer Service	-	The only fire protection component is for maintaining unmetered fire lines - taken as 2% of services' cost

supply water solely to private fire protection equipment, such as sprinklers and hose cabinets. Because fire line sizes are larger than general services, 2% of the operating costs for services is assigned to fire protection. No debt costs are allocated because fire line construction costs are paid in full by benefiting customers.

The cost allocation parameters are summarized in Exhibit 5.

SECTION 4

THE COST OF EXTRA CAPACITY FOR FIRE PROTECTION IS SIGNIFICANT - A PHASING-IN PROGRAM IS PROPOSED

EXHIBIT 6

1983 CURRENT HALTON WATER BUDGET

EXPENDITURES	TOTAL
1) Administration Charges	$ 810,900
2) Operations	4,014,260
3) HEC Charges	1,332,785
4) Taxes & Insurance	328,300
5) Debt Charges	3,884,300
6) Capital Contribution	968,350
7) Rate Stabilization Reserve	129,305
	$11,468,200

REVENUE	
1) Rates	$ 8,961,600
2) SAG	1,100,000
3) GSG	438,000
4) Local Improvements	152,400
5) Hydrants	540,100 (1)
6) Transfer from Reserves	-
7) Miscellaneous - Costs Recovered	3,700
- Plant Service Charges	9,800
- Maintenance - Service Charges	239,900
- Inspection Fees	22,700
	$11,468,200

Note: (1) The actual amount billed was $537,544

SECTION 4

THE COST OF EXTRA CAPACITY FOR FIRE PROTECTION IS SIGNIFICANT A PHASING-IN PROGRAM IS PROPOSED

The total 1983 current water expenditure budget is $11,468,200. A breakdown of the expenditures by major budget category is provided in Exhibit 6 opposite. The recommended 1983 water system fire protection charge has been calculated based on this budget information.

The fire protection charge calculation includes the following steps:

- The budget summary information is augmented by reference to the Maintenance Management System (MMS) budget detail.

- Each budget item is allocated to an appropriate functional cost category such as water supply, storage, distribution and pumping.

  Most budget categories can be attributed directly to one of the functional cost categories. For example, valve maintenance is a water main expenditure. However, some overhead items require allocation. The method used to allocate costs which relate to more than one functional category is tailored to the particular item, but is generally based on the relative size of the directly-attributable expenditures.

- The gross expenditure budget is reduced by directly-related revenue items and by the Rate Stabilization Fund contribution. The Net Expenditures are $10,910,395, as calculated in Exhibit 7, below.

- The allocation factors in Exhibit 5 are combined with the net expenditures in Exhibit 6 to calculate fire protection charges - see Exhibit 8.

EXHIBIT 8

CALCULATION OF FIRE PROTECTION COST FROM NET EXPENDITURES

	NET EXPENDITURES ($)	ALLOCATION FACTOR	FIRE PROTECTION ($)
Supply	3,753,460	0.5	18,767
Mains			
Transmission	486,878	0.5	2,434
Distribution	2,402,891	23.3	560,759
Reservoirs	562,195	22.9	128,576
Booster Pumping Stations			
Operation	713,118	0.5	3,566
Maintenance	333,710	19.7	65,781
Hydrants	362,483	100.0	362,483
Services	398,650	2.0	7,973
Meters/Billing/Collection	1,897,010	0	0
TOTAL	10,910,395		1,150,339

Adjustments to Expenditures:	
Other Revenue	428,500
Rate Stabilization Grant	129,305
Debt Variance	0
GROSS EXPENDITURES	11,468,200

EXHIBIT 7

CALCULATION OF NET 1983 EXPENDITURES

Gross Expenditures	$11,468,200
Deduct	
Local Improvement Act	152,400
Miscellaneous	
- Costs Recovered	3,700
- Plant Service Charges	9,800
- Maintenance - Service Charges	239,900
- Inspection Fees	22,700
Total Revenues Deducted	428,500
Rate Stabilization Grant	129,305
Gross Deduction	557,805
Net Expenditures	$10,910,395

The fire protection costs have been calculated in Exhibit 8, opposite. They total $1,150,339, or about 10% of gross expenditures.

More details on the fire protection charge calculation are provided in the Appendix.

The budgeted 1983 fire protection charge is $537,544. The recalculated charge is 114% greater - a significant increase. It is recommended that consideration be given to phasing in the increase over a three-year period - the same approach used for Halton water and sewer rate implementation.

The proposed implementation schedule is as follows:

EXHIBIT 9

PROPOSED PHASE-IN OF
RECOMMENDED FIRE PROTECTION CHARGE

($1983)

	1983 ACTUAL	PROPOSED 1984	1985	1986
Annual Charge	$537,544	741,809	946,074	1,150,339
Phase-In Expressed as a Percentage of Recommended Charge	46.7%	64.5%	82.2%	100.0%

The phase-in is expressed in 1983 dollars. In 1984 and 1985, the full charge would be multiplied by the above factors to obtain that year's charge. In 1986 and subsequent years, the full charge would be levied.

It is proposed that the full charge be recalculated each year, using approved budget data. The calculation would be made consistent with the method used in this report. Ideally, the fire protection charge should be recalculated using the detailed method outlined herein. An acceptable alternative would be to carry out triannual detailed recalculations, with intervening years determined based on year-to-year net water expenditure budget increases.

SECTION 5

WATER SYSTEM FIRE PROTECTION COSTS CAN BE CHARGED IN SEVERAL WAYS - THE MILL RATE IS COMMONLY USED AND IS RECOMMENDED FOR HALTON

SECTION 5

WATER SYSTEM FIRE PROTECTION COSTS CAN BE CHARGED IN SEVERAL WAYS - THE MILL RATE IS COMMONLY USED AND IS RECOMMENDED FOR HALTON

PRINCIPLES - THE USER PAYS VS. READINESS TO SERVE

Everyday water consumption is most appropriately charged based on volume used. Halton has metered rate blocks for this purpose. A consumption charge is frequently combined with a basic fixed charge for costs (such as Halton's service charges - see Appendix for current rate schedules) which do not vary with volume. Such rates for general service usually reflect the "user pays" principle. Customers pay their share of normal water consumption costs based on actual usage.

Conversely, most customers may never make use of the water system, either directly or indirectly, for fire protection. Yet the water system includes a significant capacity, on standby, for the potential benefit of all customers.

It is clearly impractical and improper to charge customers directly based on volume of water used to fight fires - that is, in a manner similar to normal consumption. It is generally accepted that the cost of this service should be shared by all in the same manner as other fire protection costs, not just those who use it.

Some municipalities allocate fire protection costs in the water rate based on a surrogate of potential fire demand. The most common method distributes costs by meter size with the charge incorporated in the water rate basic charge. Unmetered fire line charges are sometimes also utilized. This method attempts to employ the user-pays principle. Unfortunately it is only a rough approximation and in many situations, such as warehouses and shopping plazas, has no relationship to fire protection cost.

The generally-accepted method of charging for municipal costs on a "standby," or "readiness to serve" basis is the property tax. Examples of this type of cost are police, social services, and ... the fire department.

As stated in a recent publication:[1]

> "One reason for using the mill rate is that fire protection costs are primarily "standby costs" which relate to potential rather than actual demand. Property taxes are a measure of property value which in turn relates to fire protection requirements."

The property tax is not a user-pays approach; it is based on the ability to pay. This is a legitimate method used to charge for many of the services provided by government.

The American Water Works Association (AWWA), which is a strong supporter of the "user pays" approach, endorses the use of water rates to cover all costs of operating a water system, except "the case of municipal water districts that levy a nominal property tax to finance fire protection service."[2] The AWWA rate manuals go on to describe methods of segregating fire protection operating costs and the more significant capital costs. The methods used in this report are consistent with the AWWA rate manuals.

THERE ARE NO LEGISLATIVE RESTRICTIONS

Halton includes no water system costs in the Regional levy entered in the separate "box" on customers' property tax bills issued by the area municipalities. That charge covers such Regional services as police, social services, roads, etc., and is levied against all Halton property owners.

The water system fire protection costs are charged to the area municipalities and included in the local tax levy. It is paid only by property owners in the Urban Service Areas. It is charged in this manner because it is related to the provision of fire protection - a local responsibility.

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(1) Water Rates in Ontario - Principles and Practices, American Water Works Association - Ontario Section/Ontario Municipal Water Association, May, 1979, Pg. 2-27

(2) "Taxation and Revenue Allocation for Municipally-Owned Water Utilities," AWWA Journal, November, 1974

This type of charge is commonly called "hydrant rental." The power for Halton to levy this charge is provided by the Public Utilities Act, which states that, "The corporation may regulate the distribution and use of water ... and fix the price for the use thereof ... and may fix the rate or rent to be paid for the use of the water by hydrants, fire plugs and public buildings." (RSO 1970, Ch. 390, Sec. 8)

ONTARIO PRACTICE - THE MILL RATE IS WIDELY USED

Municipal water system fire protection costs are normally charged on the mill rate in Ontario. As described earlier in Section 3, 71% of regional[1] and 91% of non-regional[2] municipalities use the mill rate for water system fire protection costs. This method is common and widely accepted as a practical and appropriate method of charging water system fire protection costs.

THE USE OF THE MILL RATE IS RECOMMENDED FOR HALTON

The property tax is already an accepted method of charging for water system fire protection charges in Halton. It is recommended that the method be continued and all fire protection costs be charged in this manner. Consideration was given to including all or part of fire protection costs in the water rate; however, the following factors supported the continued use of the mill rate:

- It charges on a "readiness to serve" basis based on property assessment - the same method as fire department costs which is a local responsibility. This is more appropriate than attempting a "user pay" approach for a service which potentially benefits all, but is actually used by a few. The generally accepted method of charging for municipal costs on a "standby" or "readiness to serve" basis is the property tax.

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(1) Also see Appendix

(2) City of Peterborough - Report on Water System Fire Protection Costs - November, 1982 - Exhibit F-11

- It is commonly used in Ontario, including similar Regional municipalities

- It is proposed by the leading water industry organization, AWWA

- It is supported by legislation

- It was selected for use by the local municipalities and the adoption by Halton is a continuation of local practice.

NO CHANGE IS RECOMMENDED TO THE PRESENT METHOD OF ALLOCATING COSTS BASED ON EQUALIZED URBAN SERVICE AREA ASSESSMENT

Some municipalities express their water system fire protection charge on a per-hydrant basis. This is handy for comparing charges with other municipalities, especially for those many municipalities which do not calculate fire protection costs. Unfortunately, it can influence the number of hydrants installed in order to increase or reduce the charge levied. It serves no practical purpose in Halton and has not been calculated.

The following procedure for converting the fire protection charge into equivalent mill rates in each area municipality is currently used in Halton and is recommended:

- Obtain urban assessment data for Burlington, Acton, Georgetown, Milton and Oakville from the Regional Assessment Office (as used in the calculation of the property tax). Urban assessment should be used and rural assessment excluded. Municipal water systems are not provided in rural areas and these areas should not be charged.

- In order to be consistent with other property tax calculations, the residential assessment should be calculated at 85% of actual and the commercial/industrial calculated at 100% of weighted urban assessment.

EXHIBIT 10

ALLOCATION OF HALTON 1983 FIRE PROTECTION CHARGE TO AREA MUNICIPALITIES

(HYDRANT RENTAL)

	PROPOSED(1)						EXISTING	
CLASSIFICATION	URBAN SERVICE AREA ASSESSMENT	WEIGHTED ASSESSMENT RESIDENTIAL 85% COMM/IND 100%	1980 - 1982 AVERAGE EQUALIZATION FACTOR	WEIGHTED, EQUALIZED URBAN ASSESSMENT	SHARE (%)	HYDRANT RENTAL(1)	(2) SHARE (%)	HYDRANT RENTAL
BURLINGTON								
Residential	250,537,855	212,957,177				504,079		
Comm/Ind	91,784,846	91,784,846				(502,238)		
Total		304,742,023	11.42	2,668,494,100	43.82		43.66	234,692
HALTON HILLS								
Acton								
Residential	9,044,716	7,688,009				25,192		
Comm/Ind	3,801,822	3,801,822				(23,352)		
Total		11,489,831	8.60	133,602,700	2.19		2.03	10,912
Georgetown								
Residential	33,378,434	28,371,669				80,869		
Comm/Ind	13,353,730	13,353,730				(79,258)		
Total		41,725,399	9.75	427,952,800	7.03		6.89	37,037
MILTON								
Residential	35,350,455	30,047,887				94,098		
Comm/Ind	12,261,304	12,261,304				(96,399)		
Total		42,309,191	8.49	498,341,500	8.18		8.38	45,046
OAKVILLE								
Residential	197,595,479	167,956,157				446,101		
Comm/Ind	87,245,074	87,245,047				(449,092)		
Total		255,201,231	10.81	2,360,788,400	38.78		39.04	209,857
REGION TOTAL				6,089,179,500	100.00	1,150,339	100.00	$537,544

(1) Hydrant rental using existing % Share in brackets
(2) Existing % share based on 1982 equalization factors

. The assessments in each local system should be adjusted to a common basis by the area municipality equalization factors provided annually by the Provincial Ministry of Municipal Affairs and Housing. The factor to be used should be the average of the prior three years.

THE 1983 MILL RATE IS RECALCULATED

The apportionment of the 1983 fire protection costs to each urban area has been recalculated in Exhibit 10. The calculation is based on a fire protection cost of $1,150,339. The proposed allocation method is similar to that currently used, except the three-year average equalization factors.

SECTION 6

THE IMPACT ON MOST CUSTOMERS IS MINIMAL

EXHIBIT 11

COMPARATIVE ANNUAL WATER, SEWER AND LOCAL (GENERAL) TAX
EXISTING VS. PROPOSED

	RESIDENTIAL COMM/IND	TOTAL ASSESSMENT ($)	CONSUMPTION (CU.M.)	METER SIZE	EXISTING BILLING				PROPOSED				DIFFERENCE IN TOTAL WATER, SEWER & LOCAL TAX BILL	
					WATER	SEWER	LOCAL GENERAL TAX	TOTAL	WATER	SEWER	LOCAL GENERAL TAX	TOTAL	$	%
BURLINGTON														
Marley	R	8,788	231	Std.	77	112	476	665	69	112	483	664	(1)	(0.2%)
Lakeshore Rd.	R	10,964	272	Std.	84	124	593	801	76	124	601	801	0	0
Glastonbury Rd.	R	10,942	404	Std.	111	137	592	840	100	137	600	837	(3)	(0.3%)
North Service Rd.	C & I	66,455	2,190	2"	497	736	4,231	5,464	448	736	4,289	5,473	9	0.2%
Plains Rd. E.	C & I	25,948	676	2"	183	277	1,652	2,112	165	277	1,675	2,117	5	0.2%
Brant St.	C & I	11,117	79	2"	44	70	708	822	40	70	718	828	6	0.7%
HALTON HILLS - Acton														
Peel St.	R	6,625	165	Std.	72	98	415	585	67	98	422	587	2	0.3%
Arthur St.	R	3,000	109	Std.	59	80	188	327	55	80	191	326	(1)	(0.3%)
Wynford Pl.	R	4,375	378	Std.	120	155	274	549	112	155	279	546	(3)	(0.6%)
Commerce Cres.	C & I	30,975	2,005	1"	544	764	148	1,456	507	764	151	1,422	(34)	(2.4%)
- Georgetown														
Rexway Dr.	R	6,125	344	Std.	113	154	306	573	102	154	330	586	13	2.3%
York St.	R	5,175	384	Std.	122	166	259	547	110	166	279	555	8	1.5%
Churchill Rd. N.	R	5,125	1,003	Std.	286	215	256	757	258	215	276	749	(8)	(1.1%)
Guelph St.	C & I	156,035	1,253	2"	596	889	9,177	10,662	537	889	9,893	11,319	657	6.2%
Armstrong Ave.	C & I	106,015	8,472	2"	1,963	2,726	6,235	10,924	1,770	2,726	6,721	11,217	293	2.7%
Armstrong Ave.	C & I	43,310	4,889	2"	1,669	0	2,547	4,216	1,505	0	2,746	4,251	35	0.8%
MILTON														
Martin St.	R	5,060	213	Std.	70	104	303	477	63	104	309	476	(1)	(0.2%)
Lorne Scotts Dr.	R	6,036	214	Std.	69	103	362	534	62	103	369	534	0	0
Woodward Ave.	R	5,079	383	Std.	108	152	304	564	97	152	310	559	(5)	(0.9%)
Harrop	C & I	138,137	4,350	2"	1,220	1,784	8,276	11,280	1,100	1,784	8,437	11,321	41	0.4%
Steeles Ave.	C & I	49,795	2,200	2"	760	1,120	2,983	4,863	685	1,120	3,041	4,846	(17)	(0.4%)
Garden Lane	C & I	14,065	5,896	2"	1,483	2,189	843	4,515	1,337	2,189	859	4,385	(130)	(2.9%)
OAKVILLE														
Tisdale Cres.	R	6,500	254	Std.	84	110	365	559	78	110	371	559	0	0
Constance Dr.	R	12,552	428	Std.	121	162	705	988	113	162	717	992	4	0.4%
Culham St.	R	6,275	423	Std.	122	173	352	647	114	173	358	645	(2)	(0.3%)
Speers Rd.	C & I	136,190	68,420	3"	13,387	19,124	4,519	37,030	12,471	19,124	4,593	36,188	(842)	(2.3%)
S. Service Rd.	C & I	82,765	24,290	2"	5,073	7,261	1,604	13,938	4,726	7,261	1,630	13,617	(321)	(2.3%)
Iroquois Shore Rd.	C & I	362,120	34,872	3"	7,282	10,440	2,303	20,025	6,784	10,440	2,341	19,565	(460)	(2.3%)

SECTION 6

THE IMPACT ON MOST CUSTOMERS IS MINIMAL

Since there is no total change in expenditures, the net impact is nil on customers as a whole. However, individual customers may see a change in their total water/sewer and property tax bill:

- Customers with high assessments relative to consumption, such as shopping plazas, warehouses and dry industries, will see an increase.

- Customers with low assessments and relatively large water consumption, such as laundromats, nurseries and wet industries, will see a decrease.

- Most residential customers do not have much variation in assessment or water consumption and will have very little total impact.

- The adoption of a three-year average equalization factor to calculate each system's hydrant rental share means that there will be a slight shift (less than 1%) in charges away from customers in Milton and Oakville (see Exhibit 10).

A random sample of six customers was taken in each municipality to illustrate the impact of the proposed changes - see Exhibit 11. This represents the total impact over the three-year phase-in period.

The impact on most residential customers is minimal, just a few dollars a year, or less than 1% for over half of them. Few exceed 1%. The three industrial customers selected in Oakville illustrate the impact on large water users - such customers would tend to experience a decrease.

For most customers, the full recommended fire protection charge could be implemented in 1984, with very little impact for the majority of them. However, the three-year phasing-in will help the few with greater charge, as well as lessen the impact on the area municipality budgets.

The provision of fire protection facilities is of ongoing economic benefit to all property owners through reduced property insurance premiums. The fire insurance premiums are reduced where adequate municipal fire protection is provided. The Insurers' Advisory Organization has provided guidelines for classifying a municipality's fire protection capabilities. This assessment is based on a number of factors which are given relative weightings. The fire department and adequacy of water supply for fire fighting are each weighted at 39% when rating a municipality.

We have contacted Halton's fire insurance agent to obtain an example of how much typical insurance premiums are reduced for buildings which are serviced by adequate municipal water supplies for fire protection.

REDUCTION IN INSURANCE PREMIUMS
WHERE ADEQUATE MUNICIPAL WATER SUPPLY
FOR FIRE PROTECTION IS PROVIDED

	TYPICAL ANNUAL INSURANCE PREMIUM	
	AVERAGE RESIDENTIAL HOME	$100,000 COMMERCIAL FIRE-RESISTANT BUILDING
No municipal water supply with fire protection capacity	$300	$270
Municipal water system with fire protection capacity available	225	220
Annual saving per customer	$75/year	$50/year

Based on this information, each residential single-family dwelling customer is likely to be saving approximately $75 per year in insurance premiums due to the existence of a municipal water system with fire protection capacity. On a Halton-wide basis, the savings would be well over $2,000,000 per year in insurance premiums, or at least double the proposed fire protection charge.

APPENDIX

APPENDIX
1983 FIRE PROTECTION CHARGE DETAILED CALCULATION

FIRE PROTECTION COSTS ARE CALCULATED SEPARATELY FOR THE TWO COST CENTRES

Halton only segregates water system costs into two Cost Centres. Further cost segregation by system is not feasible.

Fortunately, the budget split also groups municipalities of similar size. This grouping by similar-sized systems allows two sets of cost factors to be developed which are valid for each Cost Centre.

THE MMS BUDGET IS USED FOR THE ANALYSIS OF EXPENDITURES

The Maintenance Management System (MMS) budget has been used as the basis for the detailed budget analysis. Each budget item has been reviewed and allocated to appropriate functional cost categories, such as supply, distribution, storage, etc. Many expenditures relate to a specific functional category and can be directly assigned. Others cover more than one category and must be allocated. The method used for each item is indicated in Exhibits A1 and A2, and is described as follows:

ALLOCATION METHOD	DESCRIPTION
Direct	Most items can be directly assigned. Only two items classified as "Direct" required additional analysis: Debt Charges and Capital out of Current. Capital from Current is based on detailed budget schedules. Debt was much more complex. Halton staff completely analyzed debenture schedules and were able to segregate many of the items. Main costs were split 25% transmission and 75% distribution. Pre-Halton debt information lacked detail. These expenditures were allocated based on the Halton debt breakdown. Unfunded debt was included. Adjustments were made for repayment of debentures in U.S. dollars.

ALLOCATION METHOD	DESCRIPTION
	The totals for both Cost Centres showed a variance of $67,697 from the budget split. The information from the debt schedules has been used, and the variance indicated on the summaries.
Method (1)	Maintenance Overhead has been allocated based on TOTAL OPERATIONS costs. Supply costs are excluded.

$$\text{e.g. Transmission} = \frac{7,439 - 699}{748,800 - 168,700 - 54,500} \times 54,500$$

$$= 0.0128 \times 54,500$$

$$= 699$$

Method (2) & (3)	Reservoirs and booster pumping stations are frequently built together. The budget does not differentiate between the two. However, they require different cost allocation procedures.
	Once constructed, reservoirs have little operating or maintenance costs. Based on discussions with works personnel, it is estimated that only 5% of item M815 and M816 budgets relate to reservoir costs, with the remaining related to power costs and maintenance for booster pumping stations.
Method (4)	The water main costs have been divided between transmission and distribution. By attempting to segregate transmission costs, we have adopted a very conservative approach. The transmission costs have been treated like supply costs, and attract minimal fire protection costs. Maintenance on transmission mains is minimal, and has been estimated at 5% of water main costs.
Method (5)	Property taxes and Insurance are allocated based on a review of actual charges.

ALLOCATION METHOD	DESCRIPTION
Method (6)	These chargebacks relate to public works expenditures and are allocated based on OPERATIONS expenditures.

e.g. Public Works chargeback allocated to "Supply"

$$= \frac{168,700}{748,800} \times 86,300$$

$$= .2253 \times 86,300$$

$$= 19,443$$

Method (7) General Administration is allocated in a manner similar to Method (6), except that HEC Billing costs are included.

e.g. General Administration chargeback allocated to "Supply"

$$= \frac{168,700}{(748,800 + 296,000)} \times 24,700$$

$$= 0.1615 \times 24,700$$

$$= 3,988$$

NET EXPENDITURES ARE CALCULATED

Certain revenues apply against specific expenditures. These include capital-related Local Improvement revenues and recoveries for services provided for others. These are deducted.

Rate Stabilization Fund contributions and draws are included in the expenditure budget, but are excluded from the analysis because they relate only to the water rates.

The fire protection cost calculation is based on net expenditures. The allocation factor used in Cost Centre A for reservoirs, pumping stations and distribution mains is 45%, and for Cost Centre B is 17%. The Halton average, based on the total net fire protection costs, is 22.9% for reservoirs, 19.7% for booster pumping stations and 23.3% for mains.

ACCT	DESCRIPTION	TOTAL EXP	ALLOC METHOD	FUNCTIONAL COST CATEGORIES: SUPPLY	MAINS: TRANS	MAINS: DIST'N	M.SER VCONS	BOOSTER OP	P. S. MAINT	HYDRANT	SERVCS	METERS BIL/COL	TOTAL
	OPERATIONS												
M003	M026 WSP Overhead	147200	Direct	147200									147200
M103-M126	Maint Overhead	238600	(1)		3690	72682	3563	33659	3577	31579	35043	54799	238600
M802	Rep to Water Mains	206500	(4)		10725	195175							206500
M803	Rep Serv Conn	111200	Direct								111200		111200
M804	Main Cleaning	5800	(4)		290	5510							5800
M805	Valve Maintenance	95500	(4)		4775	90725							95500
M806	Water Meter Install	150200	Direct									150200	150200
M808	Meter Field Serv	207500	Direct									207500	207500
M810	Field Serv Hydrant	162900	Direct							162900			162900
M811	Hydrant P.M.	53300	Direct							53300			53300
M814	Sys Stor & Pump Op	259400	(2)				12970	246430					259400
M815	Sys Stor & Pump Rep	22300	(3)				1115		21185				22300
M822	Coin Meter Mtnce	6900	Direct									6900	6900
M816	Water Locates	37500	(4)		1875	35625							37500
M817	Shut Off/Turn On	17500	Direct								17500		17500
M818	Rep Curb Stops	71900	Direct								71900		71900
M820	Invest Water Leaks	25400	(4)		1270	24130							25400
M821	Other Water Mtnce	11000	(4)		550	10450							11000
M830	Work for Others	5400	Direct			5400							5400
M830	W for O - Plant	4500	Direct	4500									4500
M831	Valve Rep/Replace	130700	(4)		6535	124165							130700
M832	Read Pit Meters	20800	Direct									20800	20800
M840	Water Filt Plant	940000	Direct	940000									940000
M841	W.F.P. Prev Mtnce	47800	Direct	47800									47800
M842	W.F.P. Repairs	84300	Direct	84300									84300
M845	Lab Analysis	3600	Direct	3600									3600
M898	Unalloc Fore G's	114360	Direct	33800		12300	12000		5000	15000	36260		114360
M899	Meter Test Program	15800	Direct									15800	15800
1170	Fringe Benefits	47900	Direct	18800	1455	27645							47900
4510	Inspection Fees	19700	Direct								19700		19700
7351	Eqpmt WM - New	0	Direct										0
	TOTAL OPERATIONS	3265460		1280000	30773	604807	29648	280089	29762	262779	291603	455999	3265460
3631	PROPERTY TAXES	264100	(5)	227126			23769	13205					264100
4302	Insurance	30100	(5)	25886			2709	1505					30100
	TOTAL TAXES/INSURANCE	294200		253012	0	0	26478	14710	0	0	0	0	294200
	ADMINISTRATION												
4215	Syst Dev Chgbk	48100	Direct									48100	48100
4216	Syst Oper Chgbk	46000	Direct									46000	46000
4230	Fin Dept Budgets	3800	Direct									3800	3800
4301	Audit Fees	11500	Direct									11500	11500
4350	Ad Chgbk Bldg Costs	50000	(7)	14876	358	7029	345	3255	346	3054	3389	17349	50000
4406	Ad Chgbk P.W.	324600	(6)	127237	3059	60120	2947	27842	2958	26121	28987	45328	324600
4460	Ad Chgbk Fin	5300	Direct									5300	5300
4462	Ad Chgbk Rev & Rec	5800	Direct									5800	5800
4464	Ad Chgbk Stores	26600	(6)	10427	251	4927	242	2282	242	2141	2375	3715	26600
4477	Ad Chgbk Water Sys	41200	(6)	16150	388	7631	374	3534	375	3315	3679	5753	41200
4479	Ad Chgbk Gen Admin	93100	(7)	27699	666	13088	642	6061	644	5687	6310	32304	93100
	TOTAL ADMINISTRATN	656000		196389	4721	92795	4549	42974	4566	40318	44740	224949	656000
4465	Ad Chgbk NEC Bill	1036785	Direct									1036785	1036785
6710	DEBT CHARGES	3113403	Direct	1262054	300160	900490	383653		267057				3113404
7760	CAP OUT OF CURRENT	425000	Direct	25000		375000						25000	425000
	GROSS EXPENDITURES	8790848		3016455	335655	1973081	444328	337773	301385	303097	336343	1742733	8790849
7804	TRSF RES RATE STABI	325255											

WATER BUDGET SUMMARY BY FUNCTIONAL COST CATEGORIES - 1983

ACCT	DESCRIPTION	TOTAL EXP	ALLOC METHOD	FUNCTIONAL COST CATEGORIES: SUPPLY	MAINS: TRANS	MAINS: DIST'N	RESER VOIRS	BOOSTER OP	P. S. MAINT	HYDRANT	METERS: SERVCS	METERS: BIL/COL	TOTAL
DEDUCT RELATED REVENUE													
DEBT-LIA		46100	Direct			46100	(6710)						46100
MAIN - Costs Recovered		2200	Direct								2200	(MB17)	2200
- Plant Service Chg		3400	Direct	3400	(MB30P)								3400
- Maint Service Chg		14300	Direct			11000	(MB30)				3300	(MB17)	14300
- Inspection Fees		3000	Direct								3000	(4510)	3000
TOTAL MISC		22900		3400	0	11000	0	0	0	0	8500	0	22900
TOTAL REVENUES		69000		3400	0	57100	0	0	0	0	8500	0	69000
NET EXPENDITURES													
ADMINISTRATION CHARGES		154900		26090	1150	23172	2141	36354	4329	7954	13877	39832	154900
DEBT CHARGES		724797		87569	125147	329340	90467	92275	0	0	0	0	724797
H.E.C. CHARGES		296000		0	0	0	0	0	0	0	0	296000	296000
TAXES AND INSURANCE		34100		11047	0	0	11413	11641	0	0	0	0	34100
OPERATING EXP (MMS)		725900		165300	7439	138837	13846	235075	27995	51432	81230	4746	725900
CONTRIBUTION TO CAPITAL		543350		453400	17488	52463	0	0	0	0	0	20000	543350
		2479047		743405	151223	543811	117867	375345	32325	59386	95107	360578	2479047
FIRE PROTECTION COSTS													
Allocation Percentages				.50	.50	45.00	45.00	.50	45.00	100.00	2.00	.00	-
ADMINISTRATION CHARGES				130	6	10428	964	182	1948	7954	278	0	21889
DEBT CHARGES				438	626	148203	40710	461	0	0	0	0	190438
H.E.C. CHARGES				0	0	0	0	0	0	0	0	0	0
TAXES AND INSURANCE				55	0	0	5136	58	0	0	0	0	5249
OPERATING EXP (MMS)				827	37	62477	6231	1175	12598	51432	1625	0	136401
CONTRIBUTION TO CAPITAL				2267	87	23608	0	0	0	0	0	0	25963
TOTAL FIRE PROTECTION COST				3717	756	244715	53040	1877	14546	59386	1902	0	379939
				(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
ALLOCATION METHODS:													
(1) In proportion to TOTAL OPERATIONS expenditures, exclucing supply;													
Allocation (%)				Excluded	1.28	25.83	2.39	40.52	4.83	8.87	15.47	.82	100.00
(2) Works estimate - Most activity related to pumping stations.													
Allocation (%)							5.00	95.00					100.00
(3) Works estimate - Most activity related to pumping stations.													
Allocation (%)							5.00		95.00				100.00
(4) Works estimate - Most activity related to distribution system.													
Allocation (%)					5.00	95.00							100.00
(5) By analysis of actual insurance and taxes.													
Allocation (%)				60.00			4.00	36.00					100.00
(6) Allocated in proportion to TOTAL OPERATIONS budget.													
Allocation (%)				22.53	.99	20.01	1.85	31.39	3.74	6.87	11.98	.63	100.00
(7) Allocated in proportion to TOTAL OPERATION + HEC budgets.													
Allocation (%)				16.15	.71	14.34	1.33	22.50	2.68	4.92	8.59	28.79	100.00

COST CENTRE 1

WATER DETAILED BUDGET ALLOCATION TO FUNCTIONAL COST CATEGORIES 1987 EXHIBIT A-1

ACCT	DESCRIPTION	TOTAL EXP	ALLOC METHOD	FUNCTIONAL COST CATEGORIES: SUPPLY	MAINS: TRANS	MAINS: DIST'N	METER VCHRS	BOOSTER PUMP	P. S. MAINT	HYDRANT	SERVICES	METERS BIL/COL	TOTAL
	OPERATIONS												
M003	M026 WSF Overhead	22400	Direct	22400									22400
M005	M126 Maint Overhead	54500	(1)		694	14077	1301	20866	2620	4832	8429	446	54500
M006	Rep to Water Mains	66400	(4)		3220	63180							66400
M007	Rep Serv Conn	56300	Direct								56300		56300
M004	Main Cleaning	10100	(4)		505	9595							10100
M005	Valve Maintenance	14700	(4)		735	13965							14700
M010	Field Serv Hydrant	27100	Direct							27100			27100
M011	Hydrant P.M.	19500	Direct							19500			19500
M014	Sys Stor & Pump Op	224200	(2)				11210	212990					224200
M015	Sys Stor & Pump Rep	26700	(3)				1335		25365				26700
M022	Coin Meter Mtnce	4300	Direct									4300	4300
M016	Water Locates	17000	(4)		850	16150							17000
M017	Shut Off/Turn On	7700	Direct								7700		7700
M018	Rep Curb Stops	14300	Direct								14300		14300
M020	Invest Water Leaks	7000	(4)		350	6650							7000
M021	Other Water Mtnce	5700	(4)		285	5415							5700
M030	Work for Others	7700	Direct			7700							7700
M030	W for O - Plant	2400	Direct	2400									2400
M031	Valve Rep/Replace	13900	(4)		695	13205							13900
M040	Water Filt Plant	83200	Direct	83200									83200
M041	W.F.P. Prev Mtnce	10000	Direct	10000									10000
M042	W.F.P. Repairs	12800	Direct	12800									12800
1170	Fringe Benefits	35200	Direct	35200									35200
4510	Inspection Fees	3000	Direct								3000		3000
7351	Eqpmt WW - New	1700	Direct	1700									1700
	TOTAL OPERATIONS	748800		168700	7439	149837	13846	235075	27995	51432	89730	4746	748800
7631	PROPERTY TAXES	24400	(5)	7905			8166	8329					24400
4302	Insurance	9700	(5)	3142			3246	3311					9700
	TOTAL TAXES/INSURANCE	34100		11047	0	0	11413	11641	0	0	0	0	34100
	ADMINISTRATION												
4215	Syst Dev Chgbl	12800	Direct									12800	12800
4216	Syst Oper Chgbl	12300	Direct									12300	12300
4230	Fin Dept Budgets	1000	Direct									1000	1000
4301	Audit Fees	3200	Direct									3200	3200
4405	Ad Chgbl F.W.	86300	(6)	19443	857	17269	1596	27093	3226	5928	10341	547	86300
4460	Ad Chgbl Fin	1300	Direct									1300	1300
4462	Ad Chgbl Rev & Rec	1500	Direct									1500	1500
4464	Ad Chgbl Stores	11800	(6)	2658	117	2361	218	3704	441	810	1414	75	11800
4479	Ad Chgbl Gen Admin	24700	(7)	3988	176	3542	327	5557	662	1216	2121	7110	24700
	TOTAL ADMINISTRATN	154900		26090	1150	23172	2141	36354	4329	7954	13877	39832	154900
4465	Ad Chgbl HEC Bill	296000	Direct									296000	296000
6710	DEBT CHARGES	770897	Direct	87569	125147	375440	90467	92275					770897
7760	CAP OUT OF CURRENT	543350	Direct	453400	17488	52463						20000	543350
	GROSS EXPENDITURES	2548047		746805	151223	600911	117867	375345	32325	59386	103607	360578	2548047
7004	TRSF RES RATE STAB	-195950											
	NET EXPENDITURES	2352097											
	Debt Variance	-67597											
	Budget Actual	2284499											

COST CENTRE 1

WATER BUDGET SUMMARY BY FUNCTIONAL COST CATEGORIES - 1983

ACCT	DESCRIPTION	TOTAL EXP	ALLOC METHOD	FUNCTIONAL COST CATEGORIES: SUPPLY	MAINS: TRANS	MAINS: DIST'N	RESER VOIRS	BOOSTER P. S. OP	BOOSTER P. S. MAINT	HYDRANT	SERVCS	METERS BIL/COL	TOTAL
DEDUCT RELATED REVENUE													
DEBT-LIA		106300	Direct			106300							106300
MAIN - Costs Recovered		1500	Direct			1500	(M830)						1500
- Plant Service Chg		6400	Direct	6400								(M806)	6400
- Maint Service Chg		225600	Direct			6200	(M830)			(M817)	13100	206300	225600
- Inspection Fees		19700	Direct							(4510)	19700		19700
TOTAL MISC		253200		6400	0	7700	0	0	0	0	32800	206300	253200
TOTAL REVENUES		359500		6400	0	114000	0	0	0	0	32800	206300	359500
NET EXPENDITURES													
ADMINISTRATION CHARGES		656000		196389	4721	92795	4549	42974	4566	40318	44740	224949	656000
DEBT CHARGES		3007103		1262054	300160	794180	383653	0	267057	0	0	0	3007104
H.E.C. CHARGES		1036785		0	0	0	0	0	0	0	0	1036785	1036785
TAXES AND INSURANCE		294200		253012	0	0	26478	14710	0	0	0	0	294200
OPERATING EXP (MMS)		3012260		1273600	30773	597107	29648	280089	29762	262779	258803	249699	3012260
CONTRIBUTION TO CAPITAL		425000		25000	0	375000	0	0	0	0	0	25000	425000
		8431348		3010055	335655	1859081	444328	337773	301385	303097	303543	1536433	8431349
FIRE PROTECTION COSTS													
Allocation Percentages				.50	.50	17.00	17.00	.50	17.00	100.00	2.00	.00	-
ADMINISTRATION CHARGES				982	24	15775	773	215	776	40318	895	0	59758
DEBT CHARGES				6310	1501	135011	65221	0	45400	0	0	0	253442
H.E.C. CHARGES				0	0	0	0	0	0	0	0	0	0
TAXES AND INSURANCE				1265	0	0	4501	74	0	0	0	0	5840
OPERATING EXP (MMS)				6368	154	101508	5040	1400	5059	262779	5176	0	387485
CONTRIBUTION TO CAPITAL				125	0	63750	0	0	0	0	0	0	63875
TOTAL FIRE PROTECTION COST				15050	1678	316044	75536	1689	51235	303097	6071	0	770400
ALLOCATION METHOD													
(2) Sys Stor & Pump Op	Allocation (%)						5.00	95.00					100.00
(3) Sys Stor & Pump Rep	Allocation (%)						5.00		95.00				100.00
(4) All WM maint items	Allocation (%)				5.00	95.00							100.00
(5) Taxes & Insurance	Allocation (%)			86.00			9.00	5.00					100.00

CURRENT METHOD OF CALCULATING 1983 HYDRANT RENTAL FEE

March 30, 1983

A) $\frac{\text{1983 Water Utility Expenditure Budget}}{\text{1982 Water Utility Expenditure Budget}}$ $\frac{11,598,000}{9,968,900}$ x100% : 16.34% increase

B) 1982 Hydrant Rental Fee = $462,046

C) 1983 Hydrant Rental Fee = $462,046 x 1.1634 = $537,544

CALCULATION AND APPORTIONMENT OF THE 1983 HYDRANT RENTAL FEE

AREA AND WEIGHTED URBAN SERVICE AREA ASSESSMENT		1982 EQUAL FACTOR	WEIGHTED EQUALIZED URBAN ASSESS.	SHARE %	1983 HYDRANT RENTAL FEE
BURLINGTON					
Residential	250,537,855				
85%	212,957,177				
Com/Ind.	91,784,846				
100%	91,784,846				
Total	304,742,023	10.22	2,981,820,186	43.66	234,692
HALTON HILLS					
Acton					
Residential	9,044,716				
85%	7,688,009				
Com/Ind.	3,801,882				
100%	3,801,822				
Total	11,489,831	8.30	138,431,699	2.03	10,912
Georgetown					
Residential	33,378,434				
85%	28,371,669				
Com/Ind.	13,353,730				
100%	13,353,730				
Total	41,725,399	8.87	470,410,361	6.89	37,037

HYDRANT RENTAL FEE

March 30, 1983

CALCULATION AND APPORTIONMENT OF THE 1983 HYDRANT RENTAL FEE

AREA AND ASSESSMENT WEIGHTED SERV. AREA	URBAN ASSESS.	1982 EQUAL FACTOR	WEIGHTED EQUALIZED URBAN ASSESS.	SHARE %	1983 HYDRANT RENTAL FEE
MILTON					
Residential -	35,350,455				
85% -	30,047,887				
Com/Ind. -	12,261,304				
100% -	12,261,304				
Total -	42,309,191	7.39	572,519,499	8.38	45,046
OAKVILLE					
Residential -	197,595,479				
85% -	167,956,157				
Com/Ind. -	87,245,074				
100% -	87,245,074				
Total -	255,201,231	9.57	2,666,679,530	39.04	209,857
REGION TOTAL			6,829,861,275	100.00	$537,544

CHANGE IN 1983 MILL RATE AND WATER RATE
EXISTING VERSUS PROPOSED

MILL RATES:

	HYDRANT RENTAL		RESIDENTIAL F.P. MILL RATE		RESIDENTIAL GENERAL MILL RATE		INCREASE
	EXIST.	PROP.	EXIST.	PROP.	EXIST.	PROP.	(%)
	(1)	(2)	(3)	(2)÷(1)x(3) (4)	(5)	(5)-(3)+(4) (6)	(6)÷(5) (7)
Burlington	234,692	504,079	0.65	1.40	54.12	54.87	1.38
Halton Hills							
Acton	10,912	25,192	0.81	1.87	62.66	63.72	1.69
Georgetown	37,037	80,869	0.75	1.64	49.99	50.88	1.78
Milton	45,046	94,098	1.07	2.24	59.91	61.08	1.94
Oakville	209,857	446,101	0.82	1.74	56.14	57.06	1.64
	537,544	1,150,339	-	-	-	-	-

WATER RATES:

Existing Rates Revenue	$8,961,600
Reduction (1,150,339 - 537,544)	(612,795)
Proposed Rates Revenue	$8,348,805
Decrease (%)	(6.84%)

FIRE UNDERWRITERS SURVEY

c/o Insurers' Advisory Organization, 180 Dundas Street West, Toronto, Ont. M5G 1Z9 (416) 597-1200

9 November 1981

Mr. R.M. Loudon
12 Ridley Boulevard
Toronto, Ontario
M5M 3K9

Dear Sir:

As requested, these are the basic fire flow requirements for the communities in the Regional Municipality of Halton. The basic fire flow requirement is the rate and duration of supply for fire demand to confine and control the fires possible in a building or group of buildings, but not necessarily the most severe situation which may be an anomaly in the community. The basic fire flow is used for our purposes as an underwriting yardstick to measure the basic fire potential against the water supply and fire department capabilities available in a municipality. These basic fire flows are provided on an advisory basis and should be helpful when reviewed in combination with more specific studies of local needs by consultants, staff or local task force in arriving at fire protection decisions based upon an analysis of local priorities and financial capabilities.

City of Burlington - 3500 Imp. g.p.m. for 3.5 hours

Town of Halton Hills -

Acton	- 2500 Imp. g.p.m. for 2.5 hours
Georgetown	- 3200 Imp. g.p.m. for 3.2 hours

Town of Oakville - 3500 Imp. g.p.m. for 3.5 hours

Town of Milton - 3200 Imp. g.p.m. for 3.2 hours.

If we can be of further assistance, please do not hesitate to contact us.

Yours truly

D. F. Cowie

David F. Cowie
Surveyor
Ontario Region

DFC:wjb

OAKVILLE
WATER AND SEWER
RESIDENTIAL RATEPAYERS

(All rates are monthly)

The following rate schedule will apply to all bills rendered on and after March 1, 1983

Service Charge	Water	Sewer
Under 1"	$ 2.72	$ 3.86
1"	4.74	6.74
1.25"	7.21	10.25
1.5"	8.43	12.02
2"	19.64	27.96
2.5"	29.57	42.11
3"	35.79	50.96
4"	61.93	88.21
6"	158.93	226.35
8"	255.89	364.50
10"	319.91	455.72

USAGE CHARGE PER CUBIC METER (m^3)

Water: 21.89 ¢/m^3 Sewer 31.19 ¢/m^3

Note: There will be no Sewer Surcharge on consumption per residential unit in excess of 46 m^3 per month

WATER AND SEWER
COMMERCIAL/INDUSTRIAL RATEPAYERS

(All rates are monthly)

The following rate schedule will apply to all bills rendered on or after February 1, 1983

Service Charge	Water	Sewer
Under 1"	$ 4.67	$ 7.49
1"	7.19	11.56
1.25"	10.29	16.51
1.5"	11.82	18.98
2"	25.85	41.50
2.5"	38.29	61.49
3"	46.07	74.00
4"	78.80	126.56
6"	200.21	321.59
8"	321.64	516.62
10"	401.81	645.39

USAGE CHARGE PER CUBIC METER (m^3)

1st 910 m^3	21.89 ¢/m^3	31.19 ¢/m^3
Balance	19.46 ¢/m^3	27.73 ¢/m^3

BURLINGTON
WATER AND SEWER
RESIDENTIAL RATEPAYERS

(All rates are monthly)

The following rate schedule will apply to all bills rendered on and after March 1, 1983

Service Charge	Water	Sewer
Under 1"	$ 2.59	$ 3.76
1"	4.49	6.55
1.25"	6.83	9.98
1.5"	7.99	11.68
2"	18.58	27.22
2.5"	28.01	41.00
3"	33.91	49.52
4"	58.65	85.85
6"	150.49	220.30
8"	242.31	354.78
10"	302.96	443.57

USAGE CHARGE PER CUBIC METER (m^3)

Water: 20.73 ¢/m^3 Sewer 30.33 ¢/m^3

Note: There will be no Sewer Surcharge on consumption per residential unit in excess of 46 m^3 per month

WATER AND SEWER
COMMERCIAL/INDUSTRIAL RATEPAYERS

(All rates are monthly)

The following rate schedule will apply to all bills rendered on or after February 1, 1983

Service Charge	Water	Sewer
Under 1"	$ 4.62	$ 7.67
1"	7.11	11.84
1.25"	10.17	16.91
1.5"	11.68	19.44
2"	25.54	42.52
2.5"	37.82	63.00
3"	45.50	75.82
4"	77.82	129.66
6"	197.74	329.49
8"	317.68	529.33
10"	396.96	661.26

USAGE CHARGE PER CUBIC METER (m^3)

1st 910 m^3	20.73 ¢/m^3	30.33 ¢/m^3
Balance	18.43 ¢/m^3	26.97 ¢/m^3

HALTON HILLS
WATER AND SEWER
RESIDENTIAL RATEPAYERS
(All rates are monthly)

The following rate schedule will apply to all bills rendered on and after March 1, 1983

Service Charge	Water	Sewer
Under 1"	$ 2.83	$ 3.86
1"	4.94	6.74
1.25"	7.62	10.25
1.5"	8.80	12.02
2"	20.49	27.96
2.5"	30.86	42.11
3"	37.36	50.96
4"	64.62	88.21
6"	165.79	226.35
8"	266.98	364.50
10"	333.82	455.72

USAGE CHARGE PER CUBIC METER (m^3)

Water: 22.84 ¢/m^3 Sewer: 31.19 ¢/m^3

Note: There will be no Sewer Surcharge on consumption per residential unit in excess of 46 m^3 per month.

WATER AND SEWER
COMMERCIAL/INDUSTRIAL RATEPAYERS
(All rates are monthly)

The following rate schedule will apply to all bills rendered on or after February 1, 1983.

Service Charge	Water	Sewer
Under 1"	$ 4.67	$ 7.49
1"	7.19	11.56
1.25"	10.29	16.51
1.5"	11.82	18.98
2"	25.85	41.50
2.5"	38.29	61.49
3"	46.07	74.00
4"	78.80	126.56
6"	200.21	321.59
8"	321.64	516.62
10"	401.81	645.39

USAGE CHARGE PER CUBIC METER (m^3)

1st 910 m^3	22.84 ¢/m^3	31.19 ¢/m^3
Balance	20.31 ¢/m^3	27.73 ¢/m^3

MILTON
WATER AND SEWER
RESIDENTIAL RATEPAYERS
(All rates are monthly)

The following rate schedule will apply to all bills rendered on and after March 1, 1983

Service Charge	Water	Sewer
Under 1"	$ 2.59	$ 3.76
1"	4.49	6.55
1.25"	6.83	9.98
1.5"	7.99	11.68
2"	18.58	27.22
2.5"	28.01	41.00
3"	33.91	49.52
4"	58.65	85.85
6"	150.49	220.30
8"	242.31	354.78
10"	302.96	443.57

USAGE CHARGE PER CUBIC METER (m^3)

Water 20.73 ¢/m^3 Sewer 30.33 ¢/m^3

Note: There will be no Sewer Surcharge on consumption per residential unit in excess of 46 m^3 per month

WATER AND SEWER
COMMERCIAL/INDUSTRIAL RATEPAYERS
(All rates are monthly)

The following rate schedule will apply to all bills rendered on or after February 1, 1983

Service Charge	Water	Sewer
Under 1"	$ 4.62	$ 7.67
1"	7.11	11.84
1.25"	10.17	16.91
1.5"	11.68	19.44
2"	25.54	42.52
2.5"	37.82	63.00
3"	45.50	75.82
4"	77.82	129.66
6"	197.74	329.49
8"	317.68	529.33
10"	396.96	661.26

USAGE CHARGE PER CUBIC METER (m^3)

1st 910 m^3	20.73 ¢/m^3	30.33 ¢/m^3
Balance	18.43 ¢/m^3	26.97 ¢/m^3

CALCULATION OF CAPACITY-RELATED FIRE PROTECTION ALLOCATION FACTORS

	BOOSTER PUMPING & DISTRIBUTION MAINS			RESERVOIR STORAGE				
				EQUALIZATION[2]		FIRE[3]		
	MAX.[4] HOUR (MGD)	FIRE[3] RATE (MGD)	% FOR[1] FIRE PROTECTION	MAX.[4] DAY (MGD)	VOL. (MG)	DURATION (HRS.)	VOL. (MG)	% FOR[1] FIRE PROTECTION
District #1	5.64	4.61	45%	3.76	0.94	3.2	0.76	45%
District #2 a)	34.70	5.04	13%	23.67	5.92	3.5	0.92	13%
b)	20.33	5.04	21%	13.55	3.39	3.5	0.92	21%
Halton Weighted[5] Average	Mains		23.3%					
	Booster Pumping Stations		19.7%			Reservoirs		22.9%

Note: 1) % for fire protection is apportioned using $\left(\frac{\text{Fire Demand}}{\text{(Fire Demand + Consumption Demand)}}\right)$

2) Equalization storage is based on 20% of maximum day plus 25% for emergencies.

3) Fire Rate is based on IAO letter (see Appendix) of 3,200 gal. per min. (4.61 mgd) for District #1 and 3,500 gal. per min. (5.04 mgd) for District #2. Storage based on fire rate at given duration plus 25% for emergencies.

4) Maximum-hour and maximum-day consumption varies roughtly in proportion to population served. Data obtained either from engineering studies or based on actual consumption.

5) Weighted based on detailed expenditure analysis in Appendix.

POOR

QUALITY

ORIGINAL